SPEECH PERCEPTION AND PRODUCTION

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Bottom-up Processing

- The incoming input as the basis for understanding a given message

- Comprehension begins with the received data that is analyzed as successive levels of organization – sounds, words, clauses, sentences, texts until meaning is derived.

- Comprehension is viewed as a process of decoding.

- The listener’s lexical and grammatical competence in a language provides the basis for this type of processing.
Clark and Clark (1977:49) summarize this view of listening in the following way:

1. [Listeners] take in raw speech and hold a phonological representation of it in working memory.

2. Immediately attempt to organize the phonological representation into constituents, identifying their content and function.

3. Identify each constituent and then construct underlying propositions, building continually onto a hierarchical representation of propositions.

4. Retain the propositions in working memory and at some point purge memory of the phonological representation. In doing this, they forget the exact wording and retain the meaning.
Example:

“The guy I sat next to on the bus this morning on the way to work was telling me he runs a Thai restaurant in Chinatown. Apparently, it’s very popular at the moment.”

To understand this utterance using bottom-up processing, we have to mentally break it down into its components ("chunking")
Chunks that guide us to the underlying core meaning of the utterances:

- the guy
- I sat next to on the bus
- this morning
- was telling me
- he runs a Thai restaurant in Chinatown
- apparently it’s very popular
- at the moment
The chunks help us identify the underlying propositions the utterances express, namely:

- I was on the bus.
- There was a guy next to me.
- We talked.
- He said he runs a Thai restaurant.
- It’s in Chinatown.
- It’s very popular now.

We remember these units of meaning and not the form in which we initially heard them.

Our knowledge of grammar helps us find the appropriate chunks, and the speaker also assists us in this process through intonation and pausing.
Top-down Processing

- Use of background knowledge in understanding the meaning of a message. – from meaning to language

- The background knowledge required for top-down processing may be:
  - previous knowledge about the topic of discourse,
  - situational or contextual knowledge, or
  - knowledge in the form of “schemata” or “scripts” – plans about the overall structure of events and the relationships between them.
For example, consider how we might respond to the following utterance:

“I heard on the news there was a big earthquake in China last night.”

On recognising the word *earthquake*, we generate a set of questions for which we want answers:

- *Where exactly was the earthquake?*
- *How big was it?*
- *Did it cause a lot of damage?*
- *Were many people killed or injured?*
- *What rescue efforts are under way?*
Much of our knowledge of the world consists of knowledge about

- specific situations,
- the people one might expect to encounter in such situations,
- what their goals and purposes are, and
- how they typically accomplish them.

In applying this prior knowledge about things, concepts, people, and events to a particular utterance, comprehension can often proceed from top down
Consider the meaning of the expression *Good luck!* and how its meaning would differ if said as a response to each of the following statements:

- I’m going to the casino.
- I’m going to the dentist.
- I’m going to a job interview.

The meaning of *good luck* differs according to the situation we mentally refer it to and according to the background knowledge we bring to each situation when it is used.
– Chapter 1

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